

Engraver

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**PLAN FOR BIOLOGICAL EVALUATION OF FIR ENGRAVER  
INFESTATIONS IN ARIZONA AND NEW MEXICO**

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**The Problem.**

The fir engraver (*Anolytus ventralis* Lee.) is a major enemy of white fir (*Abies concolor* (Gord. & Glend.) Lindl.) in the Southwest. When in an outbreak status all size trees are attacked.

Known previous infestations in the region are approximately 10 years old. In 1948 an infestation started on Sandia Mountain, east of Albuquerque, New Mexico. The infestation is currently active and has spread throughout approximately 10,000 acres of white fir. Hard-forest loss over the past several years has been placed at \$.2 million. Localized areas in the infestation have suffered 80 percent mortality. In 1958 another serious outbreak was found on the Lincoln National Forest and adjoining Mescalero Indian Reservation land. Aerial survey recorded 25,000 acres of white fir infested in 1959.

Both infestations have developed in areas of high commercial or recreational values, or both. Continuing white fir losses on Sandia Mt. seriously threatened the future recreational uses of the area. A similar situation exists on the Lincoln-Mescalero outbreak west of Ruidoso, New Mexico.

Forest officials are extremely interested in curtailing damage of existing outbreaks and for controlling future outbreaks. Basis for control will depend on a reliable and practical procedure for evaluating populations of fir engraver.

#### Literature.

- Struble, George R. 1957. The Fir Engraver--A Serious enemy of western tree firs. U.S.D.A., Report No. 11, 18 pp., illus.
- Nagel, R. H. 1956 Chemical Control of the fir Engraver. Rocky Mountain Forest and Range Experiment Station. Research Note No. 23, 3 pp.

#### Objectives.

To obtain information on the infestation pattern and insect stages in the stems of white fir in the Southwest needed to design a sampling plan for prediction of infestation trends. Tree injury such as top-killing or patch killing that occurs on white fir in California will not be investigated at this time, but will be included in a supplement evaluation plan.

#### Sampling method.

a 100 percent survey will be made to locate and obtain the d.b.h. of the 1959-infested trees in the study area. The diameter range of the infested tree will be divided into 5 class sizes and 5 trees from each class size will be sampled.

Twenty-five infested trees are to be felled and sampled for distribution of beetle entrances along the stem. Sampling

heights along the bole are as follows: 2 feet, 5 feet, 10 feet, and continuing at 5-foot intervals until upper limits of the infestation are reached. Bark sample unit is 6 x 6 inches. Two units, from opposite sides of the stem, are to be taken at each sampling height. Visual examination for the presence or absence of brood between sampling units, will be made on the circumference between samples.

#### Sampling data.

1. d.b.h. of infested tree
2. height of infested tree
3. infested height
4. d.b.h. at upper infestation limit
5. number and developmental stage of living insects
6. number and developmental stage of dead insects
7. number of successful hostile intrusions
8. inches of egg galleries
9. number and identity of control organisms and associated insects

#### Location of study.

The current infestation on Lincoln National Forest and adjoining Menominee Indian Reservation land (25,000 acres) was chosen as a study area because the infestation is relatively new and the damage is severe. Future studies may include the Sandia Mountain infestation on the Cibola National Forest.

#### Analysis of data.

This will be limited to summarizing the field data and making a comparison of insect density at the various stem heights.

#### Assignments.

D. A. Pierce and P. H. Yaginaki.

#### Schedule of work.

Field work is planned for November and December of this year. A postponement until April or May of 1960 may be necessary if extreme difficulty is encountered in spotting 1959-attacks. By the latter part of May fading of attacked trees should start. Results will be summarized by the writer in 1960. This study will not require a major change in our present program of work.

#### Cooperating agencies.

Lincoln National Forest and Mescalero Indian Reservation.